Notice of Allowability	Application No.	Applicant(s)	
	10/056,438	ZHANG ET AL.	
	Examiner	Art Unit	
	Michael B. Holmes	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *January 23, 2002*.

2. ☒ The allowed claim(s) is/are *1-54*.

3. ☒ The drawings filed on *23 January 2002* are accepted by the Examiner.

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
   a) ☐ All b) ☐ Some* c) ☐ None of the:
      1. ☐ Certified copies of the priority documents have been received.
      2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
      3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
   (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____ .
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

UNITED STATES PATENT AND TRADEMARK OFFICE

P.O. Box 1450, Alexandria, Virginia 22313-1450 - WWW.USPTO.GOV

Examiner's Detailed Office Action

1. Claims 1-54 are allowed.

REASONS FOR ALLOWANCE

2. The following is an Examiner's statement for reasons for allowance:

3. The closest art *Barnhill et al.* (USPN 6,882,990), *Barnhill* (USPN 6,658,395), *Barnhill* (USPN 6,427,141) & *Barnhill* (USPN 6,128,608 does not teach or render obvious applicant's claimed invention. In particular, as pointed out below, the art lacks certain features and the combination as specified in the respective claims.

4. With regards to claim 1 *Barnhill et al.* & *Barnhill* does not disclose the following steps (c) training and testing at least one learning machine having at least one kernel using the pre-processed sets of image data to classify the at least one feature of interest into at least one of a plurality of classes of possible feature characteristic; (d) comparing the classified features from the test set of image data with known results of the test set of image data to determine if an optimal solution is obtained; (e) repeating steps (c) and (d) if the optimal solution is not obtained; (f) if the optimal solution is obtained, inputting a live set of image data into the processor; (g) pre-processing the live set of image data to detect and extract the presence of features of interest

within the image data; (h) classifying the at least one feature of interest; and (i) generating an output comprising the classified at least one feature of interest from the live set of image data.

5. With regards to claim 16 *Barnhill et al. & Barnhill* does not disclose the following steps (a) inputting a training set of image data and a test set of image data into a processor comprising a plurality of processing modules; (b) assigning a processing module for each feature of interest; (c) for each feature of interest, pre-processing each set of image data to detect and extract the presence of that feature of interest within the image data; (d) for each feature of interest, training and testing at least one first-level support vector machine using the pre-processed sets of image data to classify the corresponding feature of interest into at least one of a plurality of possible feature characteristics; (e) comparing the classified feature from the test set of image data with known results of the test set of image data to determine if an optimal solution is obtained; (f) repeating steps (d) and (e) if the optimal solution is not obtained; (g) if the optimal solution is obtained, inputting a live set of image data into the processor; (h) pre-processing the live set of image data to detect and extract the presence of features of interest within the image data; (i) classifying each feature of interest according to its possible feature characteristics to generate an output; (j) combining the outputs for the plurality of features of interest (k) inputting the combined outputs into at least one second-level support vector machine; and (l) generating an overall output comprising a classification of the digitized image.

6. With regards to claim 29 *Barnhill et al. & Barnhill* does not disclose the following steps (a) inputting a training set of mammogram data and a test set of mammogram data into a processor comprising a plurality of detection subsystems, each detection subsystem for analyzing one of a plurality of features of interest; (b) assigning a processing module for each of the

plurality of detection subsystems; (c) in each detection subsystem, pre-processing each set of mammogram data to detect and extract the presence of a feature of interest corresponding to that detection subsystem; (d) in each detection subsystem, training and testing at least one first-level support vector machine using the pre-processed sets of mammogram data to classify the corresponding feature of interest into at least one of a plurality of possible feature characteristics; (e) comparing the classified feature from the test set of mammogram data with known analysis of the test set of mammogram data to determine if an optimal solution is obtained; (f) repeating steps (d) and (e) if the optimal solution is not obtained; (g) if the optimal solution is obtained, inputting a live set of mammogram data into the processor; (h) pre-processing the live set of mammogram data to detect and extract the presence of features of interest within the mammogram data; (i) classifying each feature of interest according to its possible feature characteristics to generate an output; (j) combining the outputs for the plurality of features of interest (k) inputting the combined outputs into at least one second-level support vector machine; and (l) generating an overall output comprising an analysis of the digitized mammogram.

7. With regards to claim 42 *Barnhill et al. & Barnhill* does not disclose an overall analyzer for combining the outputs of the plurality of detection subsystems and generating an analysis of the digitized image, the overall analyzer comprising a second-level support vector machine.

Correspondence Information

8. Any inquires concerning this communication or earlier communications from the examiner should be directed to Michael B. Holmes, who may be reached Monday through

Friday, between 8:00 a.m. and 5:00 p.m. EST. or via telephone at (571) 272-3686 or facsimile transmission (571) 273-3686 or email Michael.holmesb@uspto.gov.

If you need to send an Official facsimile transmission, please send it to (703) 746-7239.

If attempts to reach the examiner are unsuccessful the Examiner's Supervisor, Anthony Knight, may be reached at (571) 272-3687.

Hand-delivered responses should be delivered to the Receptionist @ (Customer Service Window Randolph Building 401 Dulany Street Alexandria, VA 22313), located on the first floor of the south side of the Randolph Building.

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Monday, June 06, 2005

MBH

Anthony Knight
Supervisory Patent Examiner
Group 3600